

AMENDMENT TO SPECIFICATIONS

Please amend page 1 as follows:

BAKER BOTTS, LLP

30 ROCKEFELLER PLAZA

NEW YORK, NEW YORK 10112

CHARLES E. ROOS, TRUSTEE *In Pro Se*

2507 RIDGEWOOD DRIVE

NASHVILLE, TENNESSEE 37215

Please amend the paragraph on page 21 under the heading Related Applications of the amendment to the specifications (that was amended April 23, 2004)

Related Applications:

The present application for a U.S. patent is a continuation in part of now abandoned U.S. national phase patent application serial number 09/508,998, filed June 15, 2000, based on international application number PCT/US97/16426, filed September 17, 1997, from which priority is claimed; and claims priority from a U.S. provisional patent application serial number 60/155,069, filed September 21, 1999[.].

Please amend page 1 of the application under the heading Field of the Invention, paragraph 1, as follows:

1. Field of the Invention

The invention is related to a data port and, more particularly, to a multifunction intelligent data port having a computer interface between a digital service network and a utility user's home electronics. The invention further relates to remote utility meter reading and remote load management, as well as telecommunications, Internet access and methods to provide secure digital transactions.

Please amend page 2 of the application under "2. Related Art", paragraph 4, as follows:

U.S. Patent No. 4,803,632 issued to Frew et al., incorporated herein by reference, discloses a utility meter having a CPU, a display, and associated circuitry which may be located in the conventional meter location. Frew also discloses a remote unit located inside the house

which displays the meter information and allows the customer to pay his bill by credit card. The remote unit communicates with the CPU over the house's power lines. The meter in Frew can be read by a meter reader either through the house's power lines or via optical coupling at the meter, but does not contain a multifunction data port with a voice and video interface, or other attendant electronics to provide broadband digital services with the utility and/or the Internet Service Provider (ISP) as taught by the subject invention. Similarly, Karlsson et al (4,442,492) has disclosed a limited data port interface and computer that can read a meter and transmit this information back to the utility over the power lines. Karlsson can also receive a change in power rates from the utility and transmit both the cost and power use to a device in the user's household. Furthermore, Frew et al. (4,803,632) has disclosed a device in the home that can read credit or debit cards and allows the customer to pay their power bill over the communication network. Combining Karlsson and Frew teaches a device or devices that include(s) a computer and two-way communication of utility use and billing data between the utility and its customer. The Frew and Karlsson devices have electronics primarily directed to meter reading and processing utility billing data. The purpose of the Frew patent, as stated, is "utility meter system having all of the functions and providing all of the information of interest to customers and to the utility company" The 16 digit alphanumeric display in the Frew patent is refreshed 1024 times/second. These very small data rates are orders of magnitude lower than the required rates for the multifunction data port of the present invention., and do not teach the very significant elements of the subject invention including the voice and video processor and other multiple interfaces to both the utility and the utility user's internal electronics and appliances. The specifications in the current patent application describe features in the multifunction data port that clearly distinguish it from a device like the combination of Karlsson and Frew, or either such device.

The present invention distinguishes between the limited data rates and electronics needed for automatic meter reading and the broad band Internet communication rates specified for the multifunction data port. While one potential function of the multifunction data port in the present invention is receiving and communicating data from the utility meter, it is the other features of the invention that make it unique in the art. The multifunction data port in the present invention can analyze, store and report meter and load usage information as well as communicate with the utility user's internal electronics and appliances through voice and video interfaces. The current cost to an electric utility to read their meters on-site can be as low as \$12-20 per year, while potential revenues from other

features offered by the multifunction data port to the utility user can easily be over 100 times larger. The subject invention with its multiple interfaces differ in purpose, design, utility, novelty and data rates from other remote reading meters and devices such as Karlsson and Frew.

Please amend page 6 as follows:

the specification, illustrate presently preferred exemplary embodiments of the invention, and, together with the general description given above and the detailed description of the preferred embodiments given below, serve to explain the principles of the invention.

Fig. 1 shows a perspective view of a first embodiment of [[an electric meter]] the multifunction data port according to the invention which provides an interface between an electric company, a digital service provider and a house.

Fig. 2 shows a block diagram of a second embodiment of the data port attached and connected to an electric meter and said data port encased within a meter box containing said [[an]] electric meter according to the invention which provides an interface between an electric company, a digital service provider and a house.

Fig. 3 shows a block diagram of a third embodiment of the data port connected to an electric meter according to the invention which provides an interface between an electric company, a digital service provider and a house.

Fig. 4a shows a side view of a fourth embodiment of the multifunction data port within an electric meter housing wherein a connection is made to a communication line according to the invention.

Fig. 4b shows a front view of a fourth embodiment of the multifunction data port within an electric meter housing wherein a connection is made to a communication line according to the invention.

Fig. 5a shows a side view of an embodiment of the invention with the multifunction data port located between the utility meter and the meter box. [[;]]

Fig. 5b shows a side view of an embodiment of the invention with the utility

interface apparatus or multifunction data port attached to the side of a meter box.

Fig. 5c shows a side view of an embodiment of the invention with the utility interface apparatus or multifunction data port attached to the front of a meter box.

Fig. 5d shows [[a front view of]] an embodiment of the invention with the utility interface apparatus or multifunction data port attached to the side of a power pole and thence connected to a meter box.

Fig. 5e shows a side view of an embodiment of the invention with the utility interface apparatus or multifunction data port located inside [[of]] the meter box.

Fig. 6 shows a flow diagram of an embodiment of a method using said data port [[an electric meter]] interface apparatus according to the invention, to provide [[providing a]] for secure [[terminal for]] financial transactions.

Fig. 7 shows an embodiment of as a system and apparatus for the distribution of broadband communication, other utility services and electrical power to multifamily living units and commercial buildings with the said multifunction data port.

Please amend the first complete paragraph on page 7 of the specification and every paragraph until the last paragraph on page 16 as follows:

Figure 1 shows a first embodiment of [[an electric meter 110]] a data port 165 according to the invention [[mated]] connected to a standard meter box 114 and an electric meter 110. An electric company 120 provides electrical service to a house 130 over external power lines 128 suspended by utility poles 124. Alternatively, the electric company 120 may provide electric [[al]] service to the house 130 via power lines buried under the ground.

According to the invention, electric company 120 provides a digital service [[network]] over a network communication line 160, which may be, for example, fiber optic cable, coaxial cable, wireless, power lines or twisted pair cable. Said electric company can also use communication line 163 to connect with digital service provider (ISP) 161 and through communication line 162 or wireless 164 to said house to provide a digital service network. The [[electric meter 110]] data port 165 provides an interface between the digital service network and the internal house wiring 134. Internal house wiring 134 may include, for example, power lines, telephone lines, and

television coaxial cables. An electronic interface device 150 can plug into a wall outlet 138 to access said [[the]] digital service network. Device 150 may, for example, provide video, multimedia and game signals to television or monitor 142.

As previously discussed, the electric meter 110 is owned by the electric company 120 and is installed in the meter box 114 which is provided by the building owner or by the utility. The [[electric meter 110]] dataport 165 according to the invention includes the addition of a video connection and various computer electronics and switches and in this embodiment, the data port 165 is attached by wire and/or wirelessly 164 to said meter 110. The electric meter 110 [[also]] continues to measure power consumption by standard means. The addition of the [[computer and video connection]] data port's 165 signal processing [[greatly extends the capacities of the meter and it]] permits the electric company 120 and/or the ISP 161 to provide, for example, both video and telephone communication in addition[[al]] to electrical service.

The [[computer in the electric meter 110]] data port 165 according to this embodiment of the invention may provide remote meter 110 readings and load control, simultaneously with interactive communication, and a household computer connection at very little extra cost. The [[placement of the computer]] use of the data port 165 to read [[in]] the electric meter 110 is advantageous because the electric company can justify the costs [[of the modified meter]] to a regulatory agency on the basis of remote meter readings and load control, and customer billing and communication at times of power outages and other emergencies. The [[electric meter 110]] data port 165 according to the invention also can be quickly [[exchanged and]] installed in the sealed meter box 114. The invention thus permits a regulated electric utility 120 to have an unregulated subsidiary that can deliver broadband access to digital and analog data and [[that can]] be in the telephone, video or multimedia business.

Further advantages may be realized because many electric companies already run fiber optic or coaxial cables or wireless connections to their major switching stations. Typically, utility companies have easements and own the utility poles. Therefore the electric company can easily extend these cables or wireless connections to each household.

The electric utility also has the option to work with a [[television]] cable company to use the cable company's previously existing coaxial lines. For example, the previously-existing coaxial cable may be run directly to the [[electric meter 110]] data port 165 according to the invention and thereafter supplied to the house with

multiple functions supplied by the data port 165. [[Alternatively, the coaxial cable may be tapped or spliced using a “T” connector or the like. Either of these configurations is advantageous because the]] Data port 165 [[electric meter 110]] may be installed and attached to existing coaxial cables quickly without access to the internal wiring of the house. The utility 120 may be in a good position to negotiate with the cable company because it has the alternative of running its own coaxial cable and offering Internet and digital cable service competing directly like the electric company in the Lapin article.

Figure 2 shows a block diagram of [[second]] an embodiment of a multifunction data port 270 in an electric meter case 210, according to the invention providing [[an interface between]] a connection to an electric company 220 and digital service provider 261 which provides [[a]] digital service [[network]] over network communication line 260 [[and]] to a house 230 using house power line 232 and/or communication line 236. The [[gateway]] meter case 210 is coupled to the sealed meter box 214 and protects [[has a computer]] data port 270. [[Computer]] Said data port 270 is connected to network communication line 260 through network interface 272. Said data port also includes a house interface 274 and meter interface 384 to read a standard electric power meter 280, both of which are coupled with network interface 272. Network interface 272 and a house interface 274 may comprise signal-processing computers that can function as a router for access to the Internet or other digital services networks.

Electric company 220 supplies electrical power over external power lines 228 which are connected to standard electric power meter 280 and house's internal power lines 232. House interface 274 is also coupled to house's internal power lines 232 and [[for communication thereon. House interface 274 is further optionally coupled to]] the house's other internal communication wiring 236 The house interface 274 [[is directly connected to the internal power line 232 and]] may communicate with devices such as those described in the prior art references. The house interface 274 may also transmit and receive telephone and computer signals over the internal power lines 232 and the network interface 272 may receive and transmit these signals over the network communication line 260. This configuration puts the digital service [[network]] providers 261 in communication with home electronics over the network communication line 260, through the data port 270.

The electric utility 220 and/or digital service providers 261 may, for example, compete with a local telephone company by providing a telephone device adapted to communicate over the internal power line 232 or

communication line 236 to the house interface 274 and through the data port's 270 network interface [[274]] 272 to a digital switching service 261. Thus, the voice processor [[390]] 394 shown in figure 3 may be a commercially available voice processor adapted for transmitting and receiving analog or digital voice information directly over the house internal power lines 232 [[332.]] The electric company 220 could further provide a direct connection to various long distance companies and Internet digital service providers 261. The electric utility also has the option to contact with the local phone companies and make [[s]] use of their existing switching systems.

In another example, said data port 270 with network interface 272 may function as a computer switch and Internet router and communication line 260 may be a fiber optic or coax cable or wireless. A computer switch or router operating in conjunction with [[a fiber optic]] connection 260 to a digital service [[network]] provider 261 can receive several hundred channels of information and [[also function as a data port for]] broadband data transmission. House interface 274 may be in communication with a home electronic device, such as a video monitor, and may, in response to a request from the home electronic device, function to select a desired channel for transmission over the internal power lines 232 and/or other internal wiring 236 to the home electronic device. Network interface 272 with data port 270 may be further operative to descramble signals, function as a firewall, and provide billing information. Because of the ease of installing a [[n electric meter]] data port 270 according to the invention, [[and the simplicity of the interfaces, the addition of such a fiber optic]] connection to a digital service [[network]] provider 261 is relatively inexpensive.

The meter box 214 is typically located [[at]] near the junction of the internal telephone and cable lines 236 [[, television coaxial cables]] and power lines 232, all of which belong to the home owner 230. An electric meter case 210 containing a data port 270 according to the invention, by being installed in the sealed meter box 214, puts the electric company 220 in an advantageous position to control the flow of multimedia information. Because of the advantageous location, the invention provides convenient access to the [[building]] utility user's electronics.

The electric company 220 can also provide the home owner 230 a unique advantage by integrating the various functions described herein into the data port 270 in the electric meter case 210 according to the invention. Because the electric company owns and can replace the previously-existing electric meter with an electric meter 280 and data port 270 according to the invention, the invention eliminates the need for any installation on the part of the customer 230. The invention is advantageous even in new construction situations, because no additional installation

is required. The invention provides a further advantage by not requiring a dedicated wall outlet or special wiring to provide access to a digital service network.

Figure 3 shows a third embodiment of associated electronics for a data port 370 connected to an electric meter 380 through a meter interface 384 according to the invention with a detailed block diagram of said data port, comprising a signal processing computer-router 398 which comprises and provides an interface between an electric company 320, a digital services provider 360 and a house 330. The data port 370 may be located in the electric meter case (not shown) or may be located at a distant location from the meter 380 and in communication with said meter through meter interface 384. The electric company 320 and/or the ISP 360 provides digital data services via network wireless transceiver device 361 and over fiber optic cables 364, coaxial cables 366, and twisted pair cables 368, or directly over power lines 328. The computer router 398 is coupled to the digital data services 360 through network interface 372.

Network interface 372 provides a remote wireless transceiver device 362 to communicate via wireless transmission 361. Such communication might include transmitting and receiving signals over a selected microwave frequency channel, or the publicly owned Industrial, Science and Medical (ISM) band broadcasting. Data transmission on the selected frequency channel might also include such techniques as token ring data transmission, spread spectrum transmission, and/or packet data transmission. Alternatively, wireless transmission media might include infrared, optical, cellular or satellite communications.

Said data port 370 provides a video processor 390, a modem processor 392, and a voice processor 394 and a meter interface 384, all of which are coupled to network interface 372, house interface 374, and router computer 398 for both receiving and transmitting their respective signals. Said data port 370 also provides a battery backup 376 to supply power to the data port with its attendant electronics and multiple interfaces in the event of a power failure, and a hard disk drive 399 or alternative storage device. 370

Data port ~~[[Computer]]~~ 370 may ~~[[be operative upon concurrence of such an event to]]~~ notify said electric company 320 in the event of ~~[[of the position of the]]~~ power failure. Likewise, the data port ~~[[computer]]~~ 370 may store customer service messages from the power company 320 on hard drive or memory storage device 399. In the case of a power outage as detected by the meter interface 384 ~~[[380]]~~, the data port 370 could ~~[[controller 391 could be instructed by the PC interface 398 to]]~~ retrieve a customer service message ~~[[s]]~~ from drive 399 ~~[[391]]~~ and use it to telephone and reassure the customer that the utility is aware of said power outage and is working to solve the problem. Typically, the utility customer service telephone lines are overloaded at times of power problems and the recorded messages should help to reduce the number of telephone calls.

Video processor 390 operated by the data port 370 is further coupled to de-scrambler 396 for providing de-scrambled video signals to house interface 374. For example, the video processor 390 may be a commercially available MPEG-2 decoder chip, with both audio and video decoding capability. Alternatively, multi-chip or software MPEG-2 decoders can be employed, or decoders based on other audiovisual standards, such as motion JPEG, MPEG-1, MPEG-4, H.261 or H.263 may be utilized.

The data port's 370 hard drive 399 may also be written with educational or commercial materials previously requested by the customer via messages received by ~~[[modem]]~~ processors 390, 392 & 394 at times when there is little demand for telephone usage. Such capability allows the customer fast access to materials recorded on the drive 399 without the need for high speed broadband access, in the case where such access is not available. ~~[[This, a]]~~ A full feature movie or other lengthy audiovisual materials could be ordered ~~[[in the evening]]~~ by a consumer for delivery ~~[[the following morning]]~~ during off-peak hours.

~~[[The network interface is coupled to PC interface 398. The network interface 372 is further coupled directly to house interface 374 for passing signals through without other processing.]]~~

House interface 374 is coupled to house's internal wiring including house's internal power lines 332, and telephone lines or communication wiring 338, and television coaxial cables 339. The house interface 374 may also communicate with home electronics via wireless communication 375. For example, cordless telephones communicate over short range microwave signals, including the IEEE standard 802.11a/b/g. The house interface 374 may utilize similar short-range wireless communication using antennas 378 and 377.

Computer-router [[PC interface]] 398 is coupled to house interface 374 and can provide [[for providing]] personal computer functions to users in house 330. Personal computer peripherals which require user access, such as floppy disk drives, audio speakers, and CD ROM drives, may be provided inside the house 330 and communicate with the [[PC interface]] data port's computer-router 398 through the house interface 374. Thus, the data port 370 according to the invention may be used as an Internet router 398, incorporating all the functions of a personal computer configured for Internet browsing.

Electric company 320 provides electrical power service over external power lines 328. External power lines 328 enter the meter box (not shown) 134 [[370]] to which meter 380 is sealed and then into the house 330 via power lines 332 to circuit breaker box 388. Meter interface 384 is electrically connected to [[attached or in]] the power meter 380 [[and/or meter box 370]] and it is electrically connected via power lines 332 to circuit breaker box 388. Circuit breaker box 388 passes electrical power service to house over the house's internal power lines (not shown) 134. The embodiment shown in Figure 3 is advantageous with respect to power management. For example, the electric company 320 may obtain a time of use record of both power use and power factor by communicating periodically with the data port 370 and said data port meter interface 384.

Alternatively, the device may be employed to change thermostat settings for air conditioning, heat and hot water functions in the house 330 as a function of changes in the cost and/or availability of electric power. In order to affect such changes, the utility would transmit to the device the current cost of power, which would then be compared to predetermined thresholds set by the home owner and change the temperature settings for the water heater and air conditioner. [[by the PC interface 398.]] The house owner can thus select a permitted range of thermostat changes for their electrical services based on the cost of power

In addition to reduction in costs for meter reading, the third embodiment of the data port 370 may also detect tampering or attempts at bypassing the meter 380. Likewise, a global positioning satellite may be employed to monitor the position of the meter via wireless transmission device 362 to detect movement of the device and the location of the device, in the event of a disaster or tampering.

The data port 370 coupled to electric meter 380 according to the invention can also notify the utility when there is a power outage. Another example is advantageous billing arrangements. If there was a problem with the customer's payments, the electric company 320 could instruct the [[computer]] data port 370 to notify the customer

through, for example, a message on the customer's television 142 or by email over the [[i]] Internet or any digital network as the invention prescribes.

Regarding load management, the use of triacs or other solid state switches (not shown) in meter 380 or circuit breaker box 388 enables the electric company 320 in communication with the data port 370 to selectively turn on and off the power remotely to specific circuits. For example, the electric company 320 might turn off hot water heater circuits during excess power demands. In another example, the triacs in communication with the data port 370 and the electric company 320 can be used to reduce the voltage if the power company has excess power demands. Triacs or other remotely controlled switches in the meter box 114 (not shown) coupled with the data port 370 could also be used to remotely shut off power if there is evidence of meter tampering, unpaid bills or a change in the account, such as a request for disconnect made by the house owner through the data port 370, or communicated to said data port by the electric company 320 and/or the house owner

The data port 370 coupled to the electric meter 380 according to the invention also provides advantages for the customer's own energy management. The customer can use the data port 370 coupled to the electric meter 380 according to the invention to change the thermostat settings for air conditioning and the hot water heater and to control the use and operation of appliances. This system will permit the customer to enjoy reduced rates by, for example, running the dishwasher and hot water heater at the times of lowest power demands and reducing the air conditioning load at times of peak demand. The interaction of the TV142 and internal power lines advantageously permits the power user to control their power use with the TV as a potential monitor or with the house owner's computer peripherals and the data port 370. For example, the data port 370 [[electric meter]] according to the invention can be programmed to give different customers an individual choice of lower power rates by controlling the timing of different loads or higher rates with unrestricted use of power.

The data port 370 and its multiple interfaces 372, 374, 384 coupled to electric meter 380 according to the invention also advantageously provides each household with the functional equivalent of a personal computer, which can potentially use TV142 as a monitor, and be connected to the house owner's other computers and peripheral electronic devices and microprocessors, forming a home network. The electric company 320 or the ISP 360 may supply or rent software for the personal computer 398 over the said digital service network.

For example, the electric company 320 might provide a “free” service for school children to use said data port and Internet access for their homework. This has the advantage of improving the public relations with utility customers and the state regulatory commissions as well as getting children used to using the software made available by the electric company 320 and/or the ISP 360. The data port 370 [[electric meter]] according to the invention might be used by the house owner to also utilize the [[personal]] computer-router 398 in said data port, coupled to the meter 380 to provide access to the Internet and for conducting secure financial transactions, such as described below in figure 6. The electric company 320 can also provide programming to and through the data port 370 to make it very easy for the consumer to pay their power bills each month.

A regulated utility, like an electric company 320, can justify the costs of the data port 370 coupled to the electric meter 380 according to the invention because it will reduce the costs to read meters, provide better communication between the utility and its customers and it will provide significant help in power management. The unregulated portion of the electric company 320, which could also be an ISP 360, can obtain revenues from electronic communications. Recent legislation has reduced regulation in communications and this opens the field for the electric company 320, which is already connected to every house. The data port 370 coupled to the electric meter 380 according to the invention will enable the electric company to be competition for both the telephone and television cable companies and provides a strong incentive for these companies to work with the electric company 320 by supplying a digital service network over existing telephone and television lines, by fiber optics or wirelessly, or any combination thereof according to the embodiment of the invention described in figure 3.

Figure 4a and 4b show a side and a front view, respectively, of a fourth embodiment of the data port 470 in an electric meter enclosure 412 [[410]] according to the invention wherein a connection is made to a communication line 460 & 436.

Electric meter-data port 410 has a meter enclosure 412, which encloses standard electric power meter 480 and the associated electronics of the data port 470. Meter enclosure 412 forms a seal with meter seal ring 418 to provide protection from the elements and [[Electric meter 410]] is mated with standard meter box 414 and by the seal 418[[,]] is sealed to the meter box 414. External power lines or conduit 428 enter the sealed meter box 414 from the top (or any angle or direction) and power is supplied to a house 330 through a power conduit 433 also coupled and/or connected to the data port 470 which said conduit is shown exiting the meter box 414 from the side.

Associated electronics 470 are coupled to communication line 460 through a cable 465. Electric meter enclosure 412 [[410]] provides a stress relief 467 for cable 465. Cable 465 is coupled to communication line 460 at connection point 463, and to the data port 470. Signals are communicated in the house over internal cable 436 or by power lines 332 in this embodiment.

According to the fourth embodiment, communication line 460 comprises, for example, a coaxial cable, a fiber optic cable, power line, wireless or a twisted pair telephone line. In the case of a coaxial cable, connection point 463 may be a simple coaxial “T” connection. Connection point 463 may otherwise be a “splice” type connection wherein signals on communication line 460 are passed directly onto internal cable 436 in addition to being processed by the data port and its associated electronics 470 over cable 465.

For example, communication line 460 may deliver conventional television signals to the house, some of which are scrambled or in digital format. The conventional signals could be delivered directly to the house for reception on a conventional TV. Concurrently, via a “T” connection, associated electronics in the data port 370 may process the scrambled television signals and deliver de-scrambled television signals over the house’s internal power lines for reception by a remote device 150 plugged into an electrical wall outlet. The remote device would put the de-scrambled signals, back on conventional television coaxial cable or conventional video and audio cables 339 for reception on the TV 142. Alternatively, the associated video processor 390 electronics could convert digital TV signals to analog signals and/or may shift and superimpose the de-scrambled television signal onto internal cable 339 for reception on the conventional analog TV 142.

The data port 370 according to the invention can provide numerous advantageous applications to the user. For example, the user can request information regarding the user’s utility usage and bill. The user may utilize the data port 370 according to the invention for Internet banking or to pay the utility bill and other bills via credit card or other payment arrangements.

Another example is information access. The data port 370 according to the invention could provide a virtual personal computer for the user that can be [[. That personal computer]] interfaced to the user’s home electronics and appliances. The personal computer connection feature may [[have]] provide access to various interactive computer services, supplied by the utility 320 or the ISP 360, or both. For example, the user can utilize the data port and its associated electronics 370 according to the invention to access the Internet and other information sources. The user could use their home television set 142 as a display or monitor. The electric

company 320 or the ISP 360 or both may also provide computer software and games for use [[on]] with the virtual personal computer function of the data port 370, 470 and its associated electronics and interfaces.

Both the electric company 320 and the user could use the multifunction data port 370 according to the invention advantageously for load management. The electric company 320 could, for example, suspend electric service to non-essential circuits, such as hot water heaters, during peak demand times. The user could, for example, arrange to have the dishwasher run during lower rate hours. The electric company 320 could also use the data port and its associated electronics 370 according to the invention for remote meter reading and also for detection of tampering by, for example, determining unusual changes in power usage.

The data port 370 according to the invention can also detect power outages and other problems with the electric company's distribution system. The data port's computer-router [[PC interface]] 398 may be programmed to calculate the harmonic distortion in the power line using fast Fourier transform analysis. [[Returning]] Providing this calculation of harmonics to the power company 320 via network interface 362 can enable the said company to either correct the power factor or harmonic noise or, when appropriate, to charge higher fees when the home owner or power user is creating excessive electrical noise or power factor.

Alternatively, the data port 370 device may be employed to remotely change thermostat settings for air conditioning, heat and hot water functions in the house 330 as a function of changes in the cost and/or availability of electric power; this may be accomplished by the house owner or the utility or both, though the use of the data port and its associated electronics 370. Power costs have recently gone as high as \$500 to \$1000 per kilowatt-hour at times of reduced generation capacity. In order to effect such changes, the utility 320 would transmit to the data port device 370 the current cost of power, which would then be compared to predetermined thresholds set by the home owner [[by]] on the [[PC interface]] computer router 398 of the data port 370. The amount of the change in thermostat settings could be set as a function of the current cost of a kilowatt-hour. The house owner is able to choose different ranges of thermostat settings at times of reduced generation capacity depending on the cost of electrical power. Both the utility user 330 and the utility company 320 can change thermostatic settings in this embodiment of the invention remotely over the Internet from any location utilizing the features of the data port 370. Changing settings on thermostats is a much better way for the utility to shed load than cutting power to whole regions of the city.

The data port 370 according to the invention provides a further advantage of being able to monitor and collect data on the television 142 viewing habits of the user. Safeguards ~~[[will]]~~ must insure that this information is only available if the homeowner authorizes it. Likewise, the data port 370 could be used as the means of voting or census taking. Such information can be collected at the home 330 and communicated over the communication network 362, 364, 366, 368. For example, viewing habit information may be collected by the video processor 390 of the data port 370 and stored on the hard disk or other memory device 399 of the data port 370 by the data port's router-computer [[PC interface]] 398, and transmitted to the electric company 320 upon request. Such information is useful to determine the size of the viewing audience for various different television programs. Likewise, voting, census or other information could be collected in the house 330 using a television remote control or other input device coupled to the data port as a sealed secure terminal 623.

The data port 370 according to the invention could be used for interactive instructional and job training programs in the home. An instructional program could be viewed on the user's television set and the user could, for example, use a remote control device coupled to the data port 370 to respond to multiple choice questions posed by the instructional program.

Other advantages of the data port 370 include the ability for the electric company 320 to provide video signals, such as pay-per-view programs, to the user. The signals may be scrambled at the point of distribution and de-scrambled 396 by the data port 370 according to the invention. The electric company 320 may also provide connection to various local and long distance telephone services and the ISP 360 through the data port 370 according to the invention.

Please amend the last paragraph on page 25 and first paragraph on page 26 of the specifications (that were amended Oct. 4, 2004) as follows:

A particularly advantageous use of the data port 370, 470 according to the invention includes monitoring movement and/or a personal medical alert device worn by a user inside the home. Such a device may, for example, transmit medical data on a periodic basis and be relayed to a physician through the data port 370, 470 according to the invention. For example, the device 370 could transmit information by the way of a wireless connection 361, 362 to [[the house power lines, for retransmission to]] the utility company 320 or digital service provider 360 via the computer-router [[PC interface]] 398. Alternatively, [[such a]] said device may be activated by the user to alert emergency medical services through the data port 370, 470 according to the invention. A similar advantage

can be achieved to monitor movements of a user restricted to their homes by, for example, a court order when said user is wearing a wireless homing and/or tracking device coupled to the data port 370, 470. Computer 398 in multifunction data port 370 may include global position software (GPS) [[a processor or means 351]] for detecting a satellite identified location of the personal medical alert device or such other tracking device using, for example, network wireless transmission [[361]] 362 which includes GPS satellite communications. [Computer]]
Multifunction data port 370 may also be configured to detect security breaches in the seal 418 of said [[sealed]] data port [[s]] with motion sensors (not shown).

Please amend the specification starting with the second paragraph on page 17.

As noted above, the data port 370 according to the invention can transmit and or receive information from digital and analog networks directly over the power lines 128. Any of the several well-known techniques for using power lines to transmit digital or analog information into the home 330 may be employed. For example, Dr. Sanderson has described a system for distribution of broad band multi-media services over the high-voltage cables of a power distribution network (US Patent No. 6,040,759), the disclosure of which is incorporated herein, and this 759 patent includes other references to power line carrier technology (PLC) also known as broadband over power line (BPL).

Please amend the specification starting with the last paragraph on page 22 to the third paragraph on page 23 of the amended specification of April 23, 2004

Figs. 5a – 5e illustrate various arrangements for placement of the multifunction data port 570 attached to a meter box or power pole or placed within a utility meter. Thus, in Fig 5a, an embodiment of the invention where a multifunction data port 570 is located between the utility meter 510 and the meter box 514, via meter seal rings 518 [[418]]. The multifunction data port 570 is coupled to a wireless communication line through stress relief 567 and [[cable]] antenna 565 in Fig. 5a.

In Fig. 5b, the utility interface apparatus or multifunction data port 570 is attached to the side of a meter box 514, using for example, a seal ring 518, which is also shown as seal ring 418. In some case, a conduit or connector 560 may connect data port 570 to a side of meter box 514. Conduit or connector 560 also may be similar to connection line 460 as is in (FIG.4). In Fig. 5c, the utility interface apparatus or multifunction data port 570 is attached to the front of a meter box 514. In Fig. 5d, the utility interface apparatus or multifunction data port 570 is

attached to the side of a [[meter box.]] power pole 524 with cross tie 522 and coupled to a meter box [[570]] 514 of the house 530 owner. Said data port is in a secure location near the transformer 540 under high voltage distribution lines 548 with insulators 545. Said data port is also shown connected to junction box 542 connecting lower voltage wires 528 to the step down terminals 543 of said transformer. This provides a tamper-resistant location where a potential vandal faces the threat of being electrocuted. The data port 570 in this embodiment is, as similarly illustrated in Figures 1-4, also connected to the utility company 520, the ISP, 561 by wireline 563 and wirelessly 565, 567, and thence to the electric meter 514 of the house 530 owner, also by wireline 549, 528, and wirelessly 566. Finally, in Fig. 5e, the utility interface apparatus [[or]] and multifunction data port 570 is located inside of the meter box 514.

Please amend the last complete paragraphs on Page 26 of the specification (that was amended October. 4, 2004) as follows:

In addition bank 621 has the option 635 to check if the vendor is not trustworthy or [[, e.g., because it is]] a suspect company 635 cited for fraud, prior liens or with a poor credit rating and the option to check if the vendor is not a domestic business subject to U.S. laws 630, in which event additional purchase authorization requirements may be imposed 632. [[Options 635 and 636 may be exercised sequentially. First exercising option 635, bank 621 may find that vendor is untrustworthy (untrustworthy = YES), then bank 621 may refuse authorization (641) If vendor is trustworthy (untrustworthy = NO), bank 621 may then exercise4 option 636 to check if the vendor is or is not a domestic business subject to U S laws. If vendor 630 is subject to US domestic laws, bank 621 may promptly guarantee payment to the vendor (631)]] If vendor 630 is not trustworthy 635 or subject to US domestic laws 630, bank 621 may require proof that vendor 631 has shipped the goods to purchaser before guaranteeing payment 632.

Please amend the first complete paragraphs on Page 25 of the specification (that was amended October. 4, 2004) as follows:

Fig. 6 is a flow diagram illustrating the steps of a method to conduct secure banking and Internet purchasing using the data ports. A purchaser 620 who wishes to conduct such business may use the data port, acting as a secure terminal 623, to contact his or her bank 621. At step [[650]] 620 router- computer [[370]] 398 in the data port secure terminal 623 monitors the security of the [[sealed]] data port seal 418 [[(e.g., sealing)]and/or network interface 372 [[firewalls]]] for any breaches to the physical firewall 615 In this embodiment the said data port 622 would be under seal and placed close to electric wires. When a home owner initiates a banking transaction or

Internet purchase on data port interface 620, computer-router [[PC interface]] 398 it will transmit only the encrypted data port serial number, and [[not an initial or public encryption key,]] encrypted data to the appropriate bank or other financial institution, which has stored the private encryption algorithm or key in said data port with bank customer's permission, via the [[communications]] digital services network 625. Vendor 630 is only sent an encrypted credit or debit card number designed for one time use and [[In turn,]] the bank would be the only institution, which has a look up table to associate the data port's 623 serial number with the [[initial or public key number. The bank, of course, will also have the private]] encryption key required to ultimately decode the message. In this way, a thief would have [[to not only have to break to the private key to decrypt the financial transaction, but would also need]] to gain access to both the serial number [[/]] and private key table that is only held by the financial institution 621.

Please amend the second complete paragraphs on Page 18 of the specification as follows:

Returning to Fig. 6, when a purchaser at the data port interface 620 transmits their credit or debit card information over the Internet 622 to a vendor 630 to make a purchase, the vendor will ordinarily contact 624 the bank 621 that issued the credit card [[621]] to verify the transaction. The bank then checks to determine whether the purchaser has sufficient funds to conduct the transaction/Internet purchase 622. In accordance with the present invention, in order to verify that the purchase has originated from the homeowner's secure terminal 623 the bank can also send a query 625 to the homeowner's data port secure terminal 623 if the card number is not encrypted and lacks code from card's magnetic strip showing that vendor 630 used said card for the authorization request 624. If sufficient funds are lacking 633, or the purchase authorization 634 was not on the secure terminal 623 and vendor 630 did not have physical possession of said card [[523]], the bank 621 notifies the vendor 630 that payment has been refused 640 and informs the purchaser 620 the reason that the bank 621 refused payment authorization 641.

Please amend the last complete paragraph on Page 23 of the specification (that was amended April 23, 2004) as follows:

Only when all safeties are met will the bank 621 guarantee payment to the vendor 630 and the transaction is consummated 631. Each secure purchase or secure transaction by the purchaser house owner at data port interface 620 rate will generate a different encrypted key or encryption algorithm for each transaction or purchase. In this way, the purchaser 620 is offered additional consumer protection to prevent transactions initiated

by a third party ~~[[has]]~~ which may have gained unauthorized access to his or her credit card information or in dealings with potentially troublesome vendors 635.

Please amend the first complete paragraph on Page 19 of the specification as follows

Fig. 7 shows the use of the invention to sub-meter electrical power and to provide computer services and Internet access to apartment buildings military housing, residential and commercial complexes 700. This invention can be a way to bridge the “digital divide” and bring computer services and access to the Internet for transient populations and low income groups, with ~~[[all of the]]~~ benefits to ~~[[the]]~~ each consumer with meter box 740, the utility 120 and the telecommunication facility or ISP 161

Please amend the last paragraph on Page 24 of the specification (amended April 23, 2004) as follows:

The municipality or owner of the commercial or residential complex 700 can contract with the utility 120 for wholesale electric power delivered by the power line 710 to the master meter 705 before this power is distributed over the internal lines 715 to each sub meter ~~[[745]]~~ 740 in the complex 700. Each sub-meter box ~~[[745]]~~ 740 and the multifunction data port ~~[[735]]~~ 741 are attached under seal (not shown) in the sub meter box 740. ~~[[The data port 735 may be a commercially obtained data port unit (for example a unit which is marketed under the name DATAPUMP GATEWAY or GATEWAY METER)]]~~ The multiple data ports 741 are in this embodiment acting as slave units to the master data port 725 which is also an Internet router and can have multiple interfaces including video, voice, telephone, thermostatic heating and cooling, messaging and alarming, scrambling and descrambling, and digital routing as described in Figure 3 above . The multiple data ports 741 are capable of being networked with the master data port 725 in order to create a grid computing network, thus leveraging the computing power of the total of the said data ports. The landlord or municipality also can obtain broad band data access to the Internet 720 and digital data via the external signal access connection 720, which can be wireless, OC1, T1, DSL, coax cable or direct fiber, or power line carrier (PLC) or broadband over power line (BPL), or by any combinations of connections through any technologies or spectra as outlined herein. The internal Internet Router 725 sends this digital data over the internal signal lines 730 to the individual multifunction data ports ~~[[735]]~~ 741 located in each unit. The internal signal lines 730 can be optic fiber, wireless, twisted pair telephones etc. or they can represent use of the internal power lines 715 for data distribution and Internet access 710 via PLC or BPL.

Please amend the last paragraph on page 19 and page 20 of the specification as follows:

The electric meter box 740 is a secure sealed location with power[[. Location of]] for the computer and data port 741 [[in this location]] and helps to insure that this invention will remain with the property when the tenant moves and that the data port 741 will always be available for use by future residents. The secure sealed location of the data ports 741 in this embodiment protects against misappropriation of electric power or outright theft of the data port 741. The municipality or landlord can offer additional services to residents and apartment tenants through the 705 master meter, the slave unit data ports 741 and/or the data port master router-computer-central processing unit 725. These [[This]] features of this embodiment of the present invention can be used in apartments, commercial buildings, public and military housing, or sections of a city, to provide the following:

1. Data port for telecommunications, multimedia and Internet access
2. Education and Internet access
3. A secure terminal for e-Banking and e-Commerce
4. Job services and job training
5. Medical monitoring and home care
6. Time of use electric rates and energy management
7. Computer technology and games
8. De-scrambler for video and MPEG2
9. Communication and public safety
10. Controller for internal appliances
11. Networked grid computing

Additional advantages and modifications will readily occur to those skilled in the art. For example, an alternative arrangement might include having the associated data port 570 electronics located in a junction box on the utility pole or in another external location, as illustrated and described in figure 5-d above. While the foregoing embodiments have been described with reference to a house and multiple dwelling units, one skilled in the art will appreciate that the invention is applicable to other residential and commercial structures and utility infrastructure.

Therefore, the invention in its broader aspects is not limited to the specific detail and representative devices, shown and described herein. Accordingly, various modifications and alterations may be made without

departing from the spirit or scope of the general and specific inventive concepts as defined by the appended claims and their equivalents.